REMARKS/ARGUMENTS

Claims 1-21 remain pending in the present application, which is a continuation of U.S. Patent Application Serial No. 09/835,905 filed April 16, 2001.

Claims 1-21 correspond generally to cancelled claims 2-5, 7-13, 15-18 and 33-38 of the '905 application. Specifically, independent claim 1 of the present continuation application corresponds to former claim 2, with the added limitations recited in former dependent claims 6, 14 and 19 in the '905 application. In this regard, the corrosion limitation recited in former c3a50 2 has been further amended to specify that the second carbon component is substantially more resistant to corrosion ***during cell reversal at fuel cell operating temperatures*** than the first carbon-based component, and that the first carbon material has a ***BET surface area of at least 350 m^2g^{-1}***. The added subject matter in new claim 1 is fully supporting in the specification at, for example, page 25, paragraph 0039 (operating temperature limitation), and at page 31, paragraph 0048 (BET surface area limitation).

Enablement

The claims of the present continuation application have been drafted to overcome the lack of enablement objections previously asserted against the claims of the parent '905 application. In this regard, claim 1 of the present application recites that the first carbon-based component has substantially no resistance to corrosion during cell reversal at fuel cell operating temperatures and that the second carbon component is substantially more resistant to corrosion during cell

reversal at fuel cell operating temperatures than the first carbon-based component. Applicants submit that persons skilled in the technology involved here would readily discern, from the language of new claim 1, that the first carbon-based component ***exists*** at ambient conditions, as queried in the November 18, 2003 final Office Action for the '905 application, but has substantially no resistance to corrosion during episodes of cell reversal at fuel cell operating temperatures.

Patentability over the Cisar Patent

The claims of the present continuation application have also been drafted to overcome the anticipation rejection based upon Cisar et al. U.S. Patent No. 6,410,180, previously asserted against the claims of the parent '905 application. In this regard, Vulcan XC-72R was identified as Cisar's "first carbon component" in the final Office Action issued in connection with the parent '905 application. Applicants' specification, however, identifies Vulcan XC-72R as having a surface area of 228 m^2g^{-1} (see page 31, paragraph 0048). Since Cisar's Vulcan XC-72R material is not a "first carbon-based material having a BET surface area of at least 350 m^2g^{-1}", as recited in new claim 1, Cisar cannot anticipate or render obvious new claim 1 or its dependent claims 2-21. Moreover, Cisar contains no disclosure, suggestion or motivation to believe that a carbon material with a BET surface area of at least 350 m^2g^{-1} should, or even could, be employed in a fuel cell anode structure.

Patentability over the DeMarinis and Cavalca Patents

The claims of the present continuation application have also been drafted to overcome the anticipation rejections based upon DeMarinis et al. U.S. Patent No.

6,386,476 and Cavalca et al. U.S. patent No. 6,287,717, previously asserted against the claims of the parent '905 application. In this regard, the November 18, 2003 final Office Action issued in connection with the parent '905 application identified polytetrafluoroethylene (PTFE) was DeMarinis' "second carbon component" and Nafion® (perfluorosulfonic acid) as Cavalca's "second carbon component". As to Cavalca, the Office Action stated that "Teflon (PTFE) has a backbone of carbon and, therefore, has significant quantity of carbon in the material." (November 18, 2003 Office Action, paragraph 12(c)).

Applicants submit that neither of DeMarinis and Cavalca can anticipate or render obvious the applicants' claims 1-21 because the chemical components that make up Nafion and PTFE are not "carbon components", as defined in those claims. In a chemical sense, Nafion and PTFE do indeed contain carbon, but persons skilled in the technology involved here would not refer to the constituent groups of Nafion and PTFE as "carbon components" or "carbon-based components", but would instead refer to their constituent groups as "fluorocarbon components" because they are made up predominantly of carbon and fluorine atoms. The term "carbon-based components", as used throughout the present specification, refers to a component that contains at least some carbon in its ***elemental*** form. (See the present specification at, for example, page 11, paragraph 0017 ("a first carbon-based component compris[es] a first carbon material") and at page 26, paragraph 0041 (an exemplary first carbon-based component is "a high surface area carbon black"). The present specification also states:

> The first carbon-based of the present anode structure component may consist entirely of a first carbon material or may comprise a first carbon material and one or more other materials that may

> for example be present to promote the corrosion rate of the first carbon material or to act as a binder. The one or more other materials that may be present in the first carbon-based component include polymeric materials such as, for example, a proton-conducting polymer electrolyte, such as Nafion®, or a non-proton-conducting polymer such as, for example, polytetrafluoroethylene (PTFE).

(Specification at page 12, paragraph 0020). The foregoing statement would make no sense if the first carbon-based component, which can also include Nafion or PTFE, could ***itself*** be Nafion or PTFE.

A principal objective of the applicants' claimed fuel cell anode structure is to overcome operational problems associated with carbon corrosion. In this regard, the second carbon component in the applicants' claimed fuel cell anode structure is deliberately protected from carbon corrosion by the presence of the first carbon-based component. Fluorocarbon polymers, like Nafion and PTFE, do not, and cannot, corrode according to the chemical equations set forth on page 9, paragraph 0014, of the present specification (those chemical equations show a reaction involving ***elemental*** carbon). Such fluorocarbon polymers cannot, therefore, be protected from carbon corrosion as with the applicants' claimed structures, in which the second carbon-based component can act as a support for an electrocatalyst material (see applicants' claim 16) and can also serve as a carbon fill for the gas diffusion layer (see applicants' claim 17). In the applicants' claimed structure, the second carbon-based component in the electrocatalyst material or in the carbon fill is thus protected against corrosion during cell reversal.

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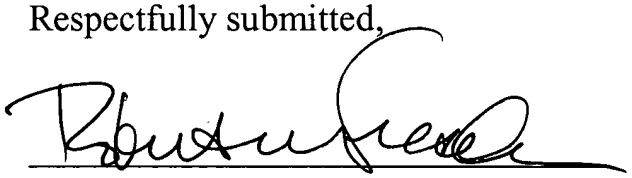
In view of the foregoing preliminary remarks, applicants request consideration and allowance of claims 1-21. The Examiner is also invited to telephone the applicants' undersigned attorney at (312) 775-8123 if an interview would expedite the Examiner's consideration of the pending claims or if any other matters remain unresolved in the present application.

Please charge any fees incurred in connection with this submission to Deposit Account No. 13-0017.

Respectfully submitted,



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